Dioxins and Furans

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Dioxin/Furan Challenges

Canada

- 90% reduction *
- by 2000

* All media within Great Lakes Basin

United States

- 75% reduction *
- by 2006

* Aggregate of air releases nationwide and water releases within the Great Lakes Basin

Progress

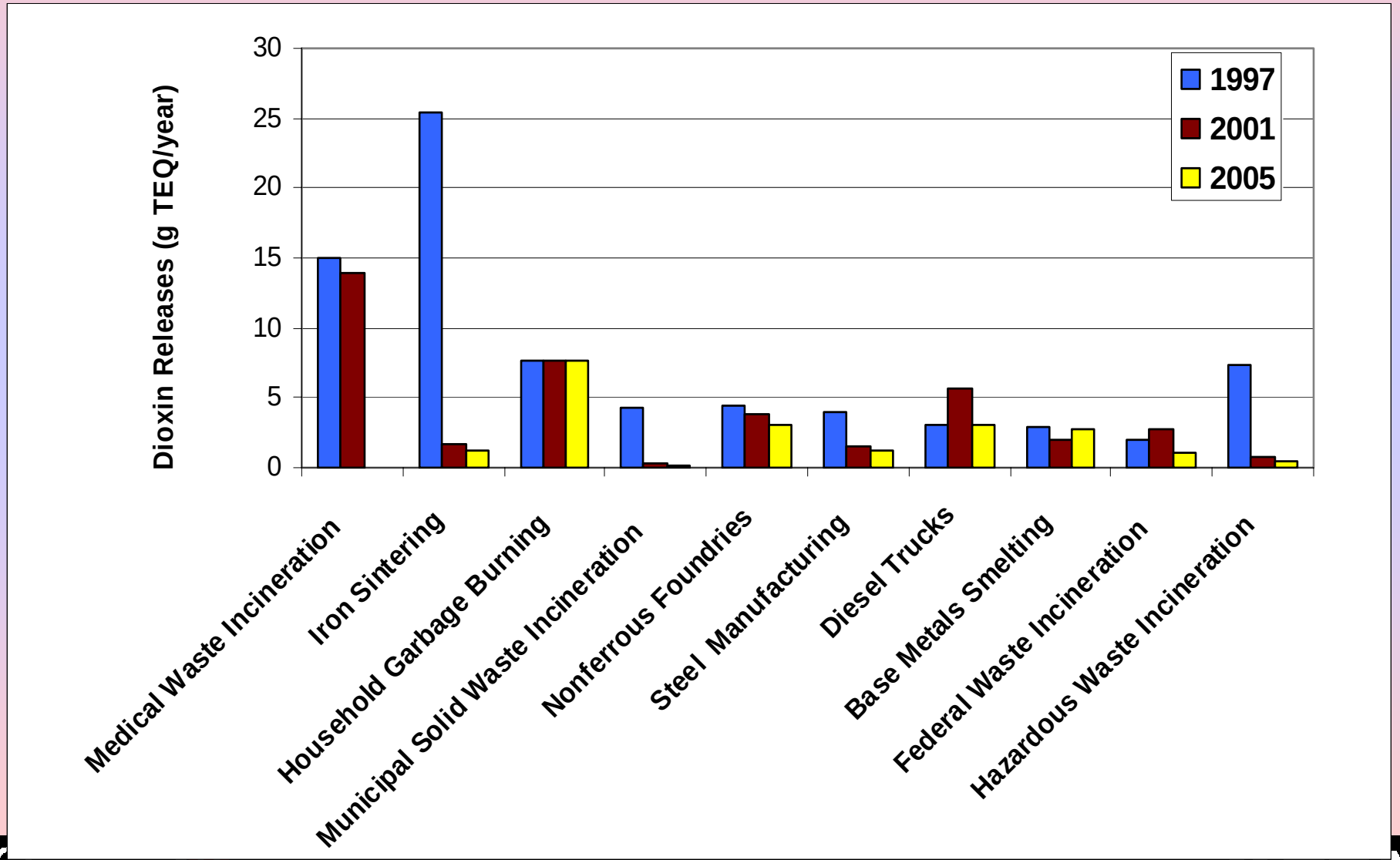
Canada:

- 87% (225 grams) reduction on total release within GL Basin
- Current total release = 34 grams
- Base year 1988 at 259 grams

United States: (Based on draft estimates)

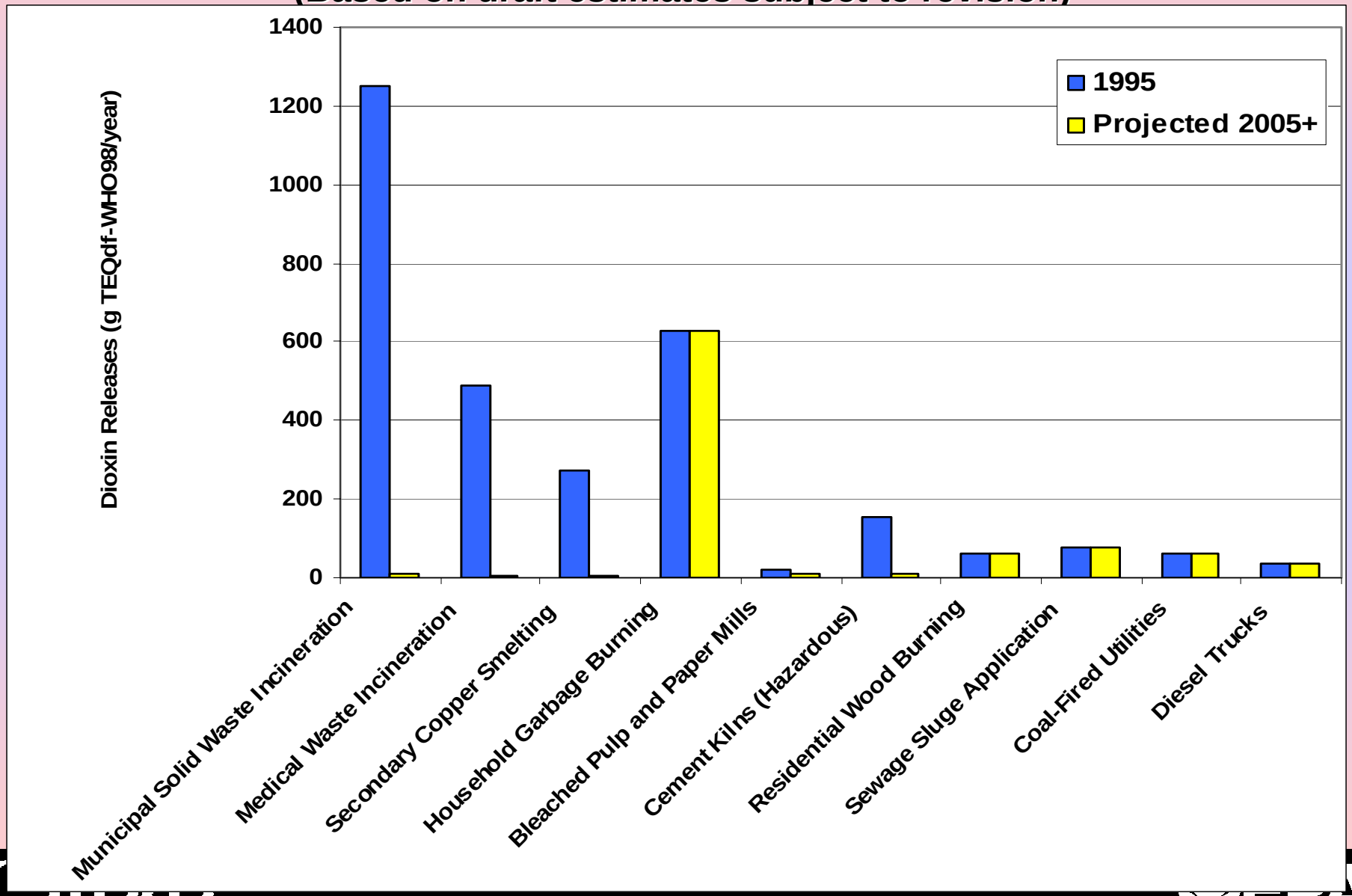
- 77% (10,743 grams) reduction on total release within U.S.
- Total release in 1995 = 3,252 grams
- Base year 1990 at 13,995 grams

Top Ontario Dioxin Releases and Projection

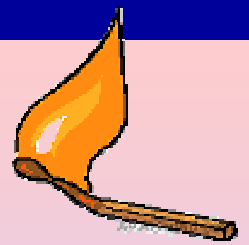


Top U.S. Dioxin Releases and Projection

(Based on draft estimates subject to revision)



Poorly Characterized Sources



- Secondary metal smelting
- Coke production
- Ceramic manufacturing
- Clay processing
- Foundries
- Asphalt mixing
- Petroleum refineries
- Industrial Boilers
- Residential wood burning
- Crematoria
- Forest fires
- Brush fires
- Range fires
- Agricultural burning
- Landfill Fires
- Structural fires
- Ash Disposal
- Copper wire smoldering
- Rural soil erosion
- Urban runoff
- Utility poles and storage yards
- Landfill fugitive emissions
- Transformer storage yards

Accomplishment Highlights

- Addressing Action Items in the Dioxin/Furan Workplan finalized in December 2003
- Highest contributing point sources are managed
- Researched on potential sources, conduct source testing
- Identifying New Sources
- Comparing data and methods from Canadian and U.S. dioxin monitoring networks
- Continuing Efforts of the Burn Barrel Subgroup
- US Moving to Finalize Utility Pole MOU

Household Garbage Burning

www.openburning.org

United States:

- Maintains a national website with brochures and other information on reducing trash burning at www.epa.gov/msw/backyard
- Developing case studies of successful alternatives to trash burning
- On-going outreach efforts led by our Great Lakes State Environmental Agencies

Canada:

- Canadian Council Ministers of the Environment (CCME) are preparing a report "Approaches to Reducing On-Site Residential Waste Combustion"
  - Environment Canada Ontario Region - continued to support community organizations (EcoSuperior Environmental Programs, Lanark and Leeds Green Community) in the development of materials and outreach. Ontario Region brochures are available on the subgroup website www.openburning.org

Outlook for Future Actions

- Continue burn barrel activities
- Finalize uncontrolled combustion papers
- Identify sources that warrant further investigation and engage these sectors
- Joint efforts with other workgroups
- Work towards finalization of the GLBTS Management Assessment

Draft D/F Management Assessment

- The Strategy identifies specific challenge goals for each Level 1 substance for the US and Canada, with a timeframe that expires in 2006
- As 2006 approaches, an analysis of progress and determination of next steps is needed
- A General Framework to Assess Management of GLBTS Level 1 Substances was developed to help determine the appropriate management outcomes for Level 1 substances
- A pilot assessment for dioxins was conducted using the general framework

Have the Challenge Goals for the Substance Been Met?

- **Canada:**

  87% reduction compared to challenge goal of 90%

- **US:**

  Met goal in 1995 (Based on draft estimates that are subject to change)

Do we have Environmental or Health Data to Assess the Impact of the Substance in the Basin?

Sufficient data in multiple media to assess partial impact in the Great Lakes Basin, including:

Fish and Wildlife:

- **USEPA Great Lakes Fish Monitoring Program (whole fish)**
- **National Listing of Fish and Wildlife Advisories**
- **US National Fish Tissue Study**
- **Canadian Wildlife Service Herring Gull Egg Monitoring Program**

Sediments:

- **USEPA time-trends study of dioxin-like compounds in sediment cores from 11 lakes in the US**
- **EC screening level survey of sediment quality in tributaries to the lower Great Lakes**
- **EC Sediment sampling in the Great Lakes**

Do we have Environmental or Health Data to Assess the Impact of the Substance in the Basin?

Open Water

- EC water quality monitoring along the St.Clair-Detroit River corridor

Ambient Air

- US National Dioxin Air Monitoring Network (NDAMN)
- Canadian National Air Pollution Surveillance (NAPS) Network
- Wet Deposition study at Burlington, Ontario

Human Biomonitoring and Food

- US National Health and Nutrition Examination Survey (NHANES)
- Statistical surveys of dioxin-like compounds in US beef, pork, poultry, and milk fat
- Health Canada surveys on dioxin levels in blood serum and food

Have Sufficient Risk Based Criteria Been Established? Are Criteria Exceeded?

- Some guidelines have been established for dioxins in sediment, open water, ambient air and fish tissue

- Exceedances:
  - sediment quality along tributaries to Lake Erie, and in Lake Erie and Lake Ontario
  - water quality along St. Clair-Detroit River Corridor
  - fish consumption advisories in all Great Lakes

- Below Guidelines:
  - sediment quality in Lake Superior (preliminary)
  - ambient air (Ontario guideline)

- Current criteria and information indicate that dioxins continue to have an impact on the Basin

Is the Trend Decreasing?

- Limited trend data available
- A long-term downward trend is evident in US and Great Lakes sediment cores, Great Lakes herring gull eggs, and average US human body burdens
- NAPS show a declining trend from 1996 to 2002 in urban ambient air but NDAMN does not yet show a clear trend for rural US sites
- Emission inventories show significant decline in major industrial source categories
- Near term trends in food levels are less clear

Environmental Analysis Conclusions

- Current environmental levels low, but risk potential remains due to toxicity and ability to bioaccumulate
- Current mean levels of general population exposure result in an estimated upper bound cancer risk in the 10^{-4} range (using EPA 1985 slope factor)
- Adverse non-cancer effects remain a concern on a par with our concern for cancer (EPA Science Advisory Board)
- Human activities most significant contributor to dioxin/furan levels in the environment
- Control programs implemented within the past 20-30 years appear to have achieved reductions of d/f levels
- There remains to be local sources impacting on the environment

Is There an Ability for the GLBTS to Affect Further Reductions?

- Opportunities identified for GLBTS action are consistent with the 2003-2005 workplan:
  - Household garbage burning
  - Characterize sources and engage sectors
  - Work with other workgroups on common sectors
  - Establish pilot educational campaign on used treated wood
  - Explore pathway intervention
  - Establish an integrated air monitoring network

Next Steps

- Consult dioxin/furan workgroup on management assessment
- Complete assessment
  - Fill in missing environmental/health data
  - Incorporate input from workgroup consultation
  - Require further assessment on effectiveness of management options

- GLBTS Dioxin Workgroup will continue activities identified in its workplan in 2005